

### **REMARKS**

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

Claims 21-30 are pending in this application. Claims 21-24, 26 and 28 have been amended, and new claims 29-30 have been added. Support for the amended and new claims can be found in the original claims, the drawings, and throughout the specification, for example at paragraphs [0044]-[0046], [0055]-[0065] and [0069]-[0070]. No new matter enters by these amendments. Accordingly, claims 21-30 are believed to be allowable over the prior art of record for the reasons set forth below.

#### **Amendments to The Specification and Drawings**

As noted by the Examiner, the present application claims priority to Israeli Patent Application Serial Number IL 136,685, filed June 12, 2000. Pursuant to the Examiner's suggestion, a certified copy of this Israeli priority application was filed in the present application on September 27, 2005. Further, the first paragraph (unnumbered) of the application has been amended to update the status of the U.S. parent application, which has since issued as U.S. Patent No. 6,734,334.

Paragraphs [0080] and [0147] have been amended to correct typographical errors noted by the Examiner, and as corrected in the U.S. parent application. In paragraph [0080], the relevant phrase has been amended to read "a very low concentration", and in paragraph [0147] the reference to the Example has been amended to refer to Example 6. No new matter has been added by these amendments.

The drawings have also been amended. As the Examiner noted, the version of Figure 11 originally filed in the present application was in black and white, but this same figure was filed in color in the U.S. parent application. Applicants have therefore filed, concurrently herewith, a petition under 37 C.F.R. § 1.84(a)(2) to have the color version of Figure 11 accepted herein. As this color version is part of the U.S. parent application, which is incorporated-by-reference in the present application, no new matter is added by this submission.

Figures 3, 4, and 10 have also been corrected, per the Examiner's suggestion, to correct typographical errors. Element 300 in Figures 3 and 4 was corrected to refer to Figure 6 (instead of Figure 5). Support for this amendment can be found in the original drawings, for example in Figure 6 which contains an element 300 and refers back to Figures 3 and 4. Figure 10 has also been corrected, in that the words "[transformed mineral and]" have been deleted from element 1014. Support for this amendment can be found in the specification, for example at paragraph [0104]. No new matter enters by these amendments.

#### **Amendments to the Claims**

Claim 21 has been amended to clarify that the transformation produces a waste integrated mineral. This amendment is supported by the specification, for example at Figure 2, and paragraphs [0055]-[0058] and [0062]-[0065]. Claim 21 has also been amended to specify that the immobilizing mineral is selected from the group consisting of loparite, apatite, sphe, plagioclase feldspar, sodalite, nepheline, thorite, zircon, monazite, and calcium-zeolite. This amendment is supported by the specification, for example at Table 1 following paragraph [0031]. No new matter enters by these amendments.

Claim 22 has been amended to clarify that the immobilizing mineral is activated prior to contacting it with the waste, and claim 23 has been amended to clarify that the recited “activating” step is an enhancement of the immobilized mineral, not of the waste. These amendments are supported by the specification, for example at paragraphs [0056]-[0058]. Claim 23 has also been amended per the Examiner’s suggestion to use traditional Markush language, so that it now recites “a treatment selected from the group consisting of acid, base and heat.” Claim 24 was amended to clarify that the waste product formed has a waste integrated mineral (or first barrier) encapsulated by a surrounding matrix (or third barrier). Support for this amendment can be found in the specification and the drawings, for example at paragraphs [0044]-[0046] and Figure 8. No new matter enters by these amendments.

Claim 26 has been amended to clarify that the recited process for immobilizing solid wastes comprises a solid state reaction between solid chemicals which are components of minerals. Support for this amendment can be found in the specification and the drawings, for example at paragraphs [0069]-[0070] and [0083]-[0085], Example 5, and Figures 2 and 5. Claim 28 has also been amended to clarify that the claimed heating step is a solid state reaction, and that the entire claimed process produces a waste product having a waste integrated mineral (first barrier), an effective coating (second barrier) and a surrounding matrix (third barrier). Support for this amendment can be found in the specification and the drawings, for example at paragraphs [0069]-[0070], and [0089]-[0092], and Figure 7. No new matter enters by these amendments.

New claims 29-30 have been added. Support for these claims is found throughout the application, including the specification, drawings, and the original claims, for example at Figure 2, and paragraphs [0055]-[0058] and [0062]-[0065]. No new matter enters by these claims. These claims are believed to be free of the cited art, for the reasons discussed *infra* with respect to the Scheffler and Brownell references, and thus their immediate allowance is respectfully requested.

### **The Rejections Under Section 112**

In the Office Action, claims 21-25 were rejected under Section 112, first paragraph, as allegedly failing to comply with the written description requirement. The Examiner raises two concerns – first, that the specification does not use the precise term “waste integrated immobilizing mineral” that is found in the claims, and second, that the specification does not describe transformation of the waste *and* the immobilizing mineral in step 114. Applicants respectfully disagree, and traverse this rejection.

Claims 21-25 are drawn to a process for immobilizing wastes as shown in Figure 2, for example by elements 112 and 114, and described in the specification at, for example, paragraphs [0059-0065]. As the written description makes clear, in step 112 (absorption) waste is integrated with an immobilizing mineral, and in step 114 (transformation) the “resulting product of step 112” is heated to transform a less stable mineral to a more stable mineral. See, for example, Figure 2 at elements 112, 114 and paragraphs [0059] and [0063]. Example 1 also describes these same two steps, in paragraphs [00126] and [00127], which are reproduced herein for convenience:

[00126] 2. **Absorption** Thorium nitrate crystalline hydrate was dissolved in water resulting in an aqueous solution containing thorium. This solution was then stirred with the calcium-zeolite crystals (the crystals had a particle size of less than 300 microns) at room temperature and then dried in a furnace at 110°C for about two hours.

[00127] 3. **Transformation** The resulting crystals were then heated for about 12 hours at about 800°C resulting in the calcium-zeolite being transformed into feldspar containing thorium. The heating was done at the atmospheric pressure in a furnace.

Thus, the specification plainly describes the two steps of claim 21: the absorption of waste by an immobilizing mineral, followed by the transformation of the resultant product – referred to as the “product of step 112” in paragraph [0063] and the “resulting crystals” in paragraph [00127]. Therefore, one of skill in the art, when reading claims 21-25 in view of the specification and the drawings, would understand that the “waste integrated immobilizing mineral” of claim 21 is the same as the “product of step 112.”

Applicants respectfully remind the Examiner that the specification need not describe the invention *in ipso verbis* in order to satisfy the written description requirement. *See, e.g., Gentry Gallery v. Berkline Corp.*, 134 F.3d 1473, 1479, 45 U.S.P.Q.2d 1498, 1503 (Fed. Cir. 1998); *In re Alton*, 76 F.3d 1168, 1175, 37 U.S.P.Q.2d 1578, 1583 (Fed. Cir. 1996). It is sufficient if Applicants' description, in the specification and the figures, conveys to those of skill in the art that Applicants were in possession of the subject matter of the claim, *i.e.*, transforming waste integrated with the immobilizing mineral. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64,

19 U.S.P.Q.2d 1111, 1117 (Fed. Cir. 1991). As explained *supra*, the Examiner's concerns are overcome, because the specification and Figures do describe the subject matter of claims 21-25, particularly the transformation of the waste *and* the immobilizing mineral. Accordingly, withdrawal of this rejection is respectfully requested.

In the Office Action, claims 22 and 25-28 were rejected under Section 112, second paragraph, as allegedly being indefinite. In particular, the Examiner objects to the use of the phrases "enhancing capability" in claim 22, "surrounding matrix" in claim 25, "the mixture" in claim 26, and the "one of rock and glass" in claim 28. Applicants respectfully disagree that these claims are vague or indefinite, when read in view of the specification, and traverse this rejection. However, in the interest of furthering prosecution, the claims have been amended to clarify the claimed subject matter.

In particular, claim 22 has been amended to clarify that the enhancing refers to the enhancing via activation disclosed in the specification, and claim 24 has been amended to provide antecedent basis for the use of the phrase "surrounding matrix" in claim 25. The phrase "the mixture" in claim 26 has been deleted, and claim 28 has been amended to recite adding "rock or glass" to the mixture of waste and an immobilizing mineral. Claim 28 has been further amended to clarify that the heating step forms a waste integrated mineral (first barrier), and that the cooling step forms both an effective covering (second barrier) of the waste integrated mineral and a surrounding rock or glass matrix (third barrier).

In view of these amendments, and the support therefor as discussed *supra*, Applicants submit that the indefiniteness rejections have been obviated, and respectfully request withdrawal of the same.

**The Rejections Under Sections 102 and 103**

Claims 21-24 were rejected under Section 102(b) as allegedly anticipated by Scheffler (U.S. Patent No. 4,297,304) and Brownell (U.S. Patent No. 3,959,172), claims 26-27 were rejected under Section 102(b) as allegedly anticipated by Feng (U.S. Patent No. 5,656,009), and claim 28 was rejected under Section 102(b) or alternatively Section 103(a) as anticipated or obvious over Epelbaum et al. (Chekmir, A.S.; Simakin, A.G.; Epelbaum, M.B.; Dynamic Phenomena in the Magmatic-Fluid Systems ("Nauka", Moscow, 1991), pp. 58-80). Applicants respectfully disagree, and traverse the rejections.

For a prior art reference to anticipate under Section 102, every element of the claimed invention must be identically shown in a single reference. *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 677 (Fed. Cir. 1988). It is well-established law that an anticipatory reference "must describe the applicant's claimed invention sufficiently to have placed a person of ordinary skill in the field of the invention in possession of it" and "must put the anticipating subject matter at issue into the possession of the public through an enabling disclosure." *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990); *Chester v. Miller*, 906 F.2d 1574 (Fed. Cir. 1990). Enablement requires that "those in the art [can] make and use the invention without 'undue experimentation.'" *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991).

Scheffler is not an anticipatory reference for amended claim 21 because it fails to teach or suggest an immobilizing mineral selected from the group consisting of loparite, apatite, spen, plagioclase feldspar, sodalite, nepheline, thorite, zircon, monazite, and calcium-zeolite. As the Examiner noted, Scheffler teaches only a "clay-like substance" comprised of pottery clay, stoneware clay, porcelain clay, or kaolin, which are not immobilizing minerals recited in amended claim 21. *See* Scheffler at col. 4, ll. 52-55. Furthermore, Scheffler does not teach activation of an immobilizing mineral with acid, base, or heat (the pH treatment to which the Examiner cites is a treatment of the *waste*, not the immobilizing mineral). Applicants thus submit that Scheffler does not teach or suggest every element of claim 21 or its dependent claims 22-25. Accordingly, withdrawal of the rejection over Scheffler is respectfully requested.

Brownell is also not an anticipatory reference for amended claim 21 because it fails to teach or suggest an immobilizing mineral selected from the group consisting of loparite, apatite, spen, plagioclase feldspar, sodalite, nepheline, thorite, zircon, monazite, and calcium-zeolite. The silica gel of Brownell is not one of the immobilizing minerals recited in amended claim 21, so this rejection has been rendered moot. Brownell also fails to teach the transformation of the waste integrated immobilizing mineral to a more stable mineral. Although the Examiner asserts that the orthorhombic mode of strontium feldspar produced in Brownell is more stable than the hexagonal mode of strontium feldspar, which is true, both the orthorhombic and hexagonal crystalline modes are the *same mineral*. *See, e.g.*, Brownell at col. 6, lines 48-59. The claim requires a transformation from one mineral to a different, more stable mineral. No such transformation is taught by Brownell.



Moreover, Brownell fails to teach the enhancement step of claim 22. Although the Examiner asserted that the use of silica in gel form reads on the enhancement step of claim 22, nothing in Brownell suggests that the silica gel is capable of enhancing the ability of another mineral to integrate with waste, let alone enhance itself. Thus, because nothing in Brownell indicates that the silica gel has any enhancing capability, Brownell does not teach the subject matter of claim 22. Similarly, because amended claim 22 makes it clear that the activation of the immobilizing mineral must occur *before* it is contacted with the waste, Brownell's alleged teaching of sodium silicate as an enhancement agent is not a teaching of the claimed invention, because Brownell adds the sodium silicate to the kaolinite *after* it has been mixed with the waste. *See* Brownell at col. 12, ll. 23-35. Applicants thus submit that Brownell does not teach or suggest every element of claim 21 or its dependent claims 22-25. Accordingly, withdrawal of the rejection over Brownell is respectfully requested.

Feng is not an anticipatory reference for claims 26-27 because it fails to teach or suggest a solid state reaction between the solid waste and the components of the immobilizing mineral. Instead, as the Examiner noted, Feng teaches *melting* the waste to produce a liquid phase. *See* Feng at col. 3, ll. 37-66. Claim 26, however, recites a solid state reaction, which, by definition refers to a reaction between solid chemicals. *See* specification at paragraph [0069]. The melted waste of Feng is not a solid, and therefore does not undergo a solid-state reaction. Applicants thus submit that Feng does not teach or suggest every element of claim 26 or its dependent claim 27. Accordingly, withdrawal of the rejection over Feng is respectfully requested.

Epelbaum is not an anticipatory reference for claim 28, nor does it render claim 28 obvious, because it fails to teach or suggest a process that forms an effective covering *and* a surrounding rock or glass matrix in a single step. Claim 28 recites a step of cooling the mixture to result in formation of both an effective covering and a surrounding rock or glass matrix, as described in the specification at, for example, paragraphs [0090]-[0091] and Example 1. Epelbaum, however, does not teach such a step. In fact, Epelbaum teaches away from the invention of claim 28, in that it teaches that “the overgrown defensive zone has to be formed *before* the melting”. See Epelbaum at p. 137 (emphasis added). Thus, Epelbaum does not teach or suggest all of the claim limitations of claim 28, nor does it suggest “to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process.” *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991). Accordingly, withdrawal of the rejection over Epelbaum is respectfully requested.

#### **The Double-Patenting Rejection**

Claims 21-28 were rejected under the judicially-created doctrine of obviousness-type double patenting over claims 1-22 and 36-43 of U.S. Patent No. 6,734,334. Applicants submit a terminal disclaimer concurrently herewith to overcome this rejection. Accordingly, withdrawal of this rejection is respectfully requested.

Serial No.: 10/606,218  
Art Unit: 2682

Attorney's Docket No.: GRI-101-CON (520763-0000001)  
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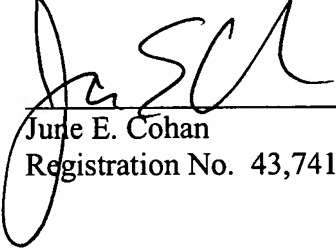
In view of the foregoing all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone applicants' undersigned representative at the number listed below.

PILLSBURY WINTHROP SHAW PITTMAN LLP  
1650 Tysons Boulevard  
McLean, VA 22102  
Tel: 703/770-7900

Date: January 5, 2006

Respectfully submitted,

By:



June E. Cohan  
Registration No. 43,741

JEC/lrhj

Customer No. 00909

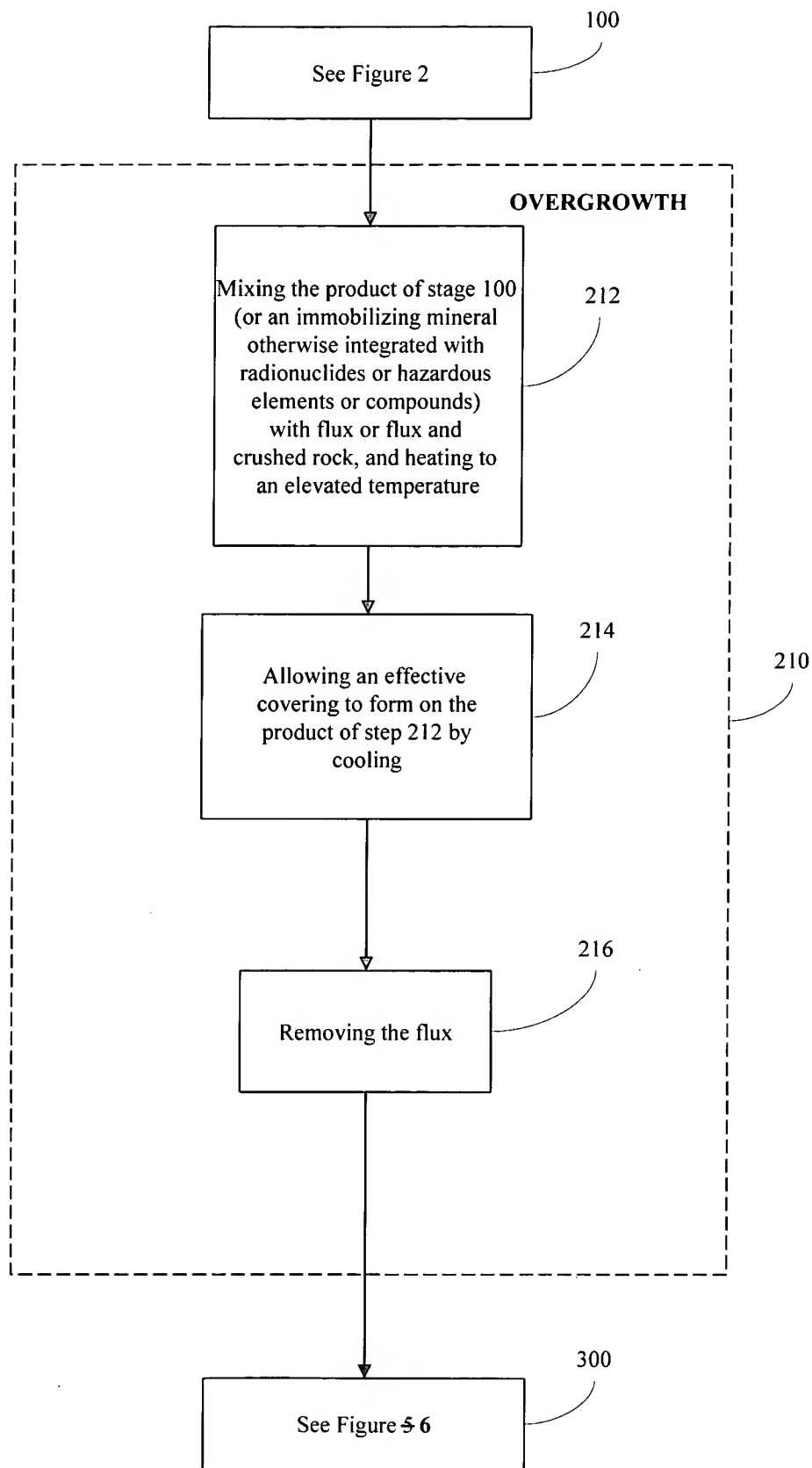
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**Amendments to the Drawings:**

The attached sheets of drawings include changes to Figs. 3, 4, and 10, and clean copies of Figs. 1, 2, 5-9, and 11. Fig. 11 is shown in color, and a petition for acceptance of this color drawing has been submitted concurrently herewith. These attached drawing sheets, which include Figs. 1-11, replace the original sheets including Figs. 1-11. Annotated sheets showing the changes made to Figs. 3, 4, and 10 are also attached.

Attachments: 11 Replacement Sheets; 3 Annotated Sheets



**Figure 3**

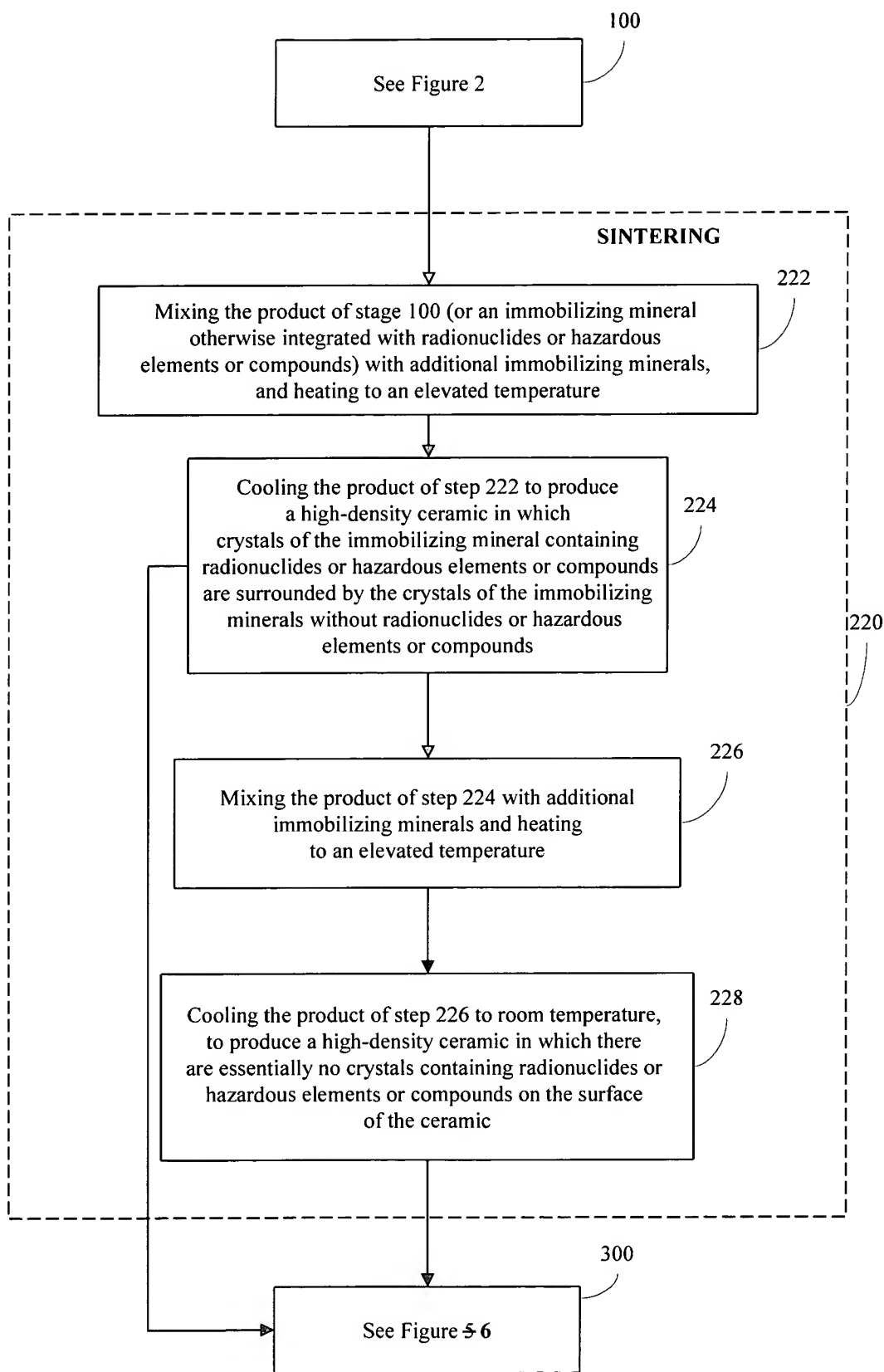


Figure 4

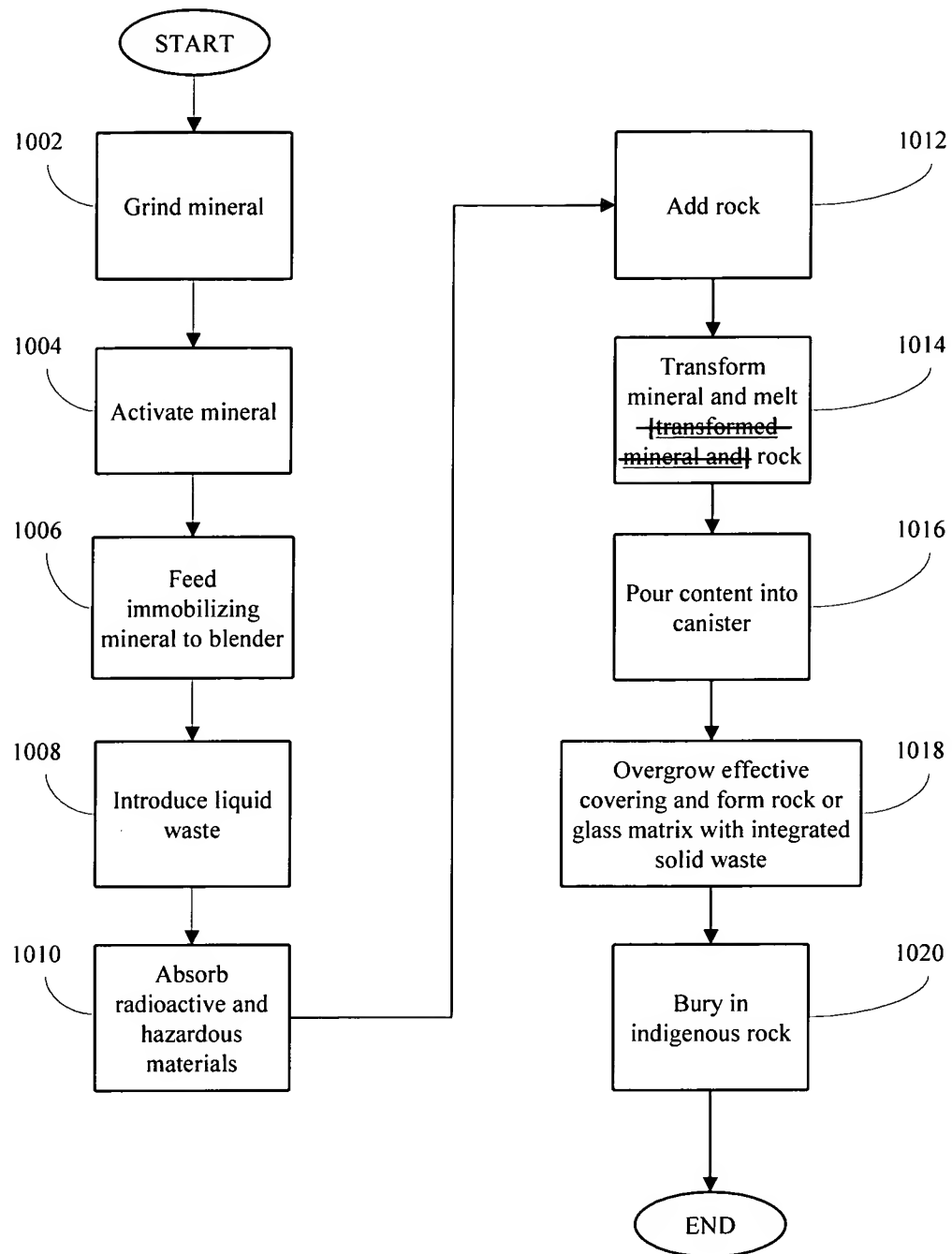


Figure 10